

**Bay Area Air Quality Management District**

939 Ellis Street  
San Francisco, CA 94109  
(415) 771-6000

**Permit Evaluation  
and  
Statement of Basis  
For a Significant Revision of the  
MAJOR FACILITY REVIEW PERMIT**

**for  
Los Medanos Energy Center, LLC  
Facility #B1866**

**Facility Address:**  
750 East Third Street  
Pittsburg, CA 94565

**Mailing Address:**  
P.O. Box 551  
Pittsburg, CA 94565

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**Los Medanos Energy Center, LLC; Plant #11866  
750 East 3<sup>rd</sup> Street, Pittsburg CA 94565****BACKGROUND**

The Los Medanos Energy Center, LLC (LMEC) is applying for the following changes to the permit conditions governing their gas turbines.

- LMEC is requesting an increase in the gas turbine start-up mass emission rate limits to account for the extended duration of cold steam turbine start-ups\* which can take up to six hours (360 minutes). Under the current permit conditions, cold gas turbine start-ups are limited to 180 minutes.
- LMEC is requesting the exclusion of gas turbine combustor tuning activities from the BACT emission rate limits governing baseload gas turbine operation. The exclusion would apply to combustor tuning activities that occur after the periodic replacement of combustor parts under routine maintenance. After approximately 10,000 firing hours, selected components of the gas turbine combustors must be replaced as recommended maintenance. After the new parts are installed, the turbine combustors must be tuned at various speeds and load levels. During this tuning, the turbine is held at various operating points for several minutes at a time. The turbine does not comply continuously with the CO and NOx emission limitations while its combustors are being tuned.

\*cold steam turbine start-ups occur after the steam turbine has been down for more than 72 hours

The proposed changes will not require any increases in facility daily emissions since the operator will still comply with the requirement that only one turbine can be in start-up mode at any one time. The proposed changes will not result in any increase in annual mass emission rates since the steam turbine cold starts will occur only a few times per year and combustor tuning episodes will only occur once every 10,000 firing hours for each gas turbine. Therefore, no offsets will be required. However, the increase in gas turbine start-up emission rates for NOx trigger PSD modeling to determine the corresponding maximum 1-hr average NOx impact.

**CRITERIA-POLLUTANT EMISSION SUMMARY****Annual Average Project Emissions Increase:**

Pollutant	lb/day	ton/yr
POC	0	0
NO <sub>x</sub>	0	0
SO <sub>2</sub>	0	0
CO	0	0
PM <sub>10</sub>	0	0
NPOC	0	0

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**Daily Maximum Emissions by Source (lb/day):**

As stated earlier, there will be no increase in maximum daily mass emissions for any pollutants for the gas turbines as a result of the proposed changes in permit conditions. Although the gas turbine start-up emission rates will increase when the steam turbine is “cold” (ie has been down for more than 72 hours), the existing daily combined mass limits for the gas turbines will not be exceeded since they are based upon the “worst-case” emission scenario wherein all three turbines will be started in one day. The owner/operator will manage the start-up of the gas turbines so that the daily limits are not exceeded.

**PERMIT CONDITION CHANGES****S-1 & S-3 Gas Turbines**

Under the current definition established when the LMEC was originally permitted, the duration of a cold gas turbine start-up is limited to 180 minutes. The term “cold gas turbine start-up” is a misnomer since the controlling factor in the duration of a gas turbine start-up is the temperature of the steam turbine and not the gas turbine. If the steam turbine is down for more than 72 hours, then its components must be brought up to temperature slowly to control the rate of thermal expansion of those components.

During the original permitting of the LMEC, Calpine assumed that true “cold” steam turbine start-ups, which can last up to 360 minutes, would not occur because they expected at least one turbine to be in operation virtually year round to satisfy expected demand. Therefore, they did not expect the steam turbine to be down for more than 72 hours. However, they have experienced cold steam turbine start-ups which have required start-ups in excess of 180 minutes in accordance with steam turbine manufacturer’s (Toshiba) recommendations.

The gas turbine start-up limits will be modified as shown in part 23 of condition 16676:

23. The pollutant emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or shutdown or during a gas turbine combustor tuning period shall not exceed the limits established below. ~~These limits apply to any 60-minute period, not a three-hour average.~~ (PSD)

	Start-Up (lb/start-up)	Shutdown (lb/shutdown)	<u>Steam Turbine Cold Start-up or Combustor Tuning Period (lb/start-up or lb/period)</u>
(a) Oxides of Nitrogen (as NO <sub>2</sub> )	240	20	<u>600</u>
(b) Carbon Monoxide (CO)	2514	44.1	<u>2514</u>
(c) Precursor Organic Compounds (as CH <sub>4</sub> )	48	8	<u>96</u>

The following definition of steam turbine cold start-up, combustor tuning activities, and combustor tuning period will be added to the definitions section of permit condition 16676.

Steam Turbine Cold Start-up: The lesser of the first 360 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine

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fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 21(b) and 21(d), following a steam turbine shutdown of at least 72 hours.

Combustor Tuning Activities: All testing, adjustment, tuning, and calibration activities recommended by the gas turbine manufacturer to insure safe and reliable steady-state operation of the gas turbines following replacement of the combustor. This includes, but is not limited to, adjusting the amount of fuel distributed between the combustion turbine's staged fuel systems to simultaneously minimize NO<sub>x</sub> and CO production while minimizing combustor dynamics and ensuring combustor stability.

Combustor Tuning Period: The cumulative period, not to exceed 360 minutes, during which combustor tuning activities are taking place

#### Other Changes/Corrections to Title V Permit

The term "condition" has been changed to "part" in the permit conditions in keeping with Title V convention.

Typographical errors in emission rates limits have been corrected in various Part VII tables.

#### FACILITY CUMULATIVE INCREASE

(since April 5, 1991)

As stated earlier, the proposed permit condition changes will not result in any increase in facility annual emissions. Therefore, there will be no change in the facility cumulative increase.

#### TOXIC RISK SCREENING ANALYSIS

Because the proposed permit condition changes will not result in any increase in annual toxic air contaminant emissions from any source at the LMEC facility, no toxic risk screening is required.

#### BACT ANALYSIS

Because the proposed permit condition changes will not result in any increase in daily or annual emissions from any source at the LMEC facility, the BACT provision of NSR does not apply.

#### OFFSET ANALYSIS

Because the proposed permit condition changes will not result in any increase in facility annual criteria pollutant emissions, the offset provisions of NSR do not apply.

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**PSD AIR QUALITY IMPACT ANALYSIS**

When the LMEC was originally permitted, the short-term air quality impacts during gas turbine start-up periods was modeled to comply with the District PSD regulations. Although PSD delegation was recently revoked by EPA, the District regulations still contain the PSD modeling requirements. Therefore, the 1-hr NO<sub>x</sub> impact of the LMEC during start-up must be remodeled to reflect the increases in short-term NO<sub>x</sub> mission rates. EPA Region IX will issue the revised PSD permit.

The changes in gas turbine start-up emission rates are shown in the following table:

**Current and Proposed Emission Rate Limits during  
Steam Turbine Cold Start-up and Combustor Tuning**

Operating Mode	NO <sub>x</sub>	
	Current	Proposed
Steam Turbine Cold Start-up or Combustor Tuning (lb/hr)	80	120
Steam Turbine Cold Start-up or Combustor Tuning (lb/period)	240	300

Because the gas turbines at LMEC are equipped with oxidation catalysts, there will be no increase in CO and POC emission rates during steam turbine cold start-ups or combustor tuning episodes.

The results of the revised PSD modeling are shown below.

**California and National Ambient Air Quality Standards and  
Ambient Air Quality Levels from the Proposed Project (µg/m<sup>3</sup>)**

Pollutant	Averaging Time	Maximum Background	Maximum Project impact	Maximum Project impact plus maximum background	California Standards	National Standards
NO <sub>2</sub>	1-hour	164	235	399	470	---

As shown, the maximum project impacts resulting from the increased gas turbine NO<sub>x</sub> emission rates during start-up and combustor tuning will not result in the exceedance of any applicable state or federal ambient air quality standards.

Pursuant to BAAQMD Regulation 2-2-414.1, the applicant has submitted a modeling analysis that adequately estimates the revised air quality impacts of the LMEC project. The applicant's analysis was based on EPA-approved models and was performed in accordance with District Regulation 2-2-414.

Pursuant to Regulation 2-2-414.2, the District has found that the modeling analysis has demonstrated that the proposed emission increases from the LMEC facility, in conjunction with all other applicable

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emissions, will not cause or contribute to a violation of applicable ambient air quality standards for NO<sub>2</sub> and CO or an exceedance of any applicable PSD increment.

Please see appendix A for further detail regarding the PSD air quality impact analysis.

**TITLE IV/V OPERATING PERMIT ANALYSIS**

Pursuant to Regulation 2-6-226.6, the proposed changes in gas turbine start-up emission rates, allowance for combustor tuning, and related changes in permit conditions constitute significant permit revisions for the purposes of Title V permitting since they trigger case-by-case determinations relative to the air quality impact analysis requirements of PSD. Consequently, the public notice and public comment requirements of Regulation 2-6-412 must be fulfilled prior to the issuance of the revised Title V permit for the facility.

**FEE SUMMARY**

Source	Filing Fee <sup>a</sup>	Initial Fee <sup>a</sup>	Major Facility Review Permit Revision Fee <sup>b</sup>	Permit to Operate Fee	Sub-Total
S-1 Gas Turbine	\$250.00	\$61,560.00	\$150.00	\$0.00	\$61,960.00
S-3 Gas Turbine	\$0.00	\$0.00	\$150.00	\$0.00	\$150.00
				<b>Grand Total</b>	<b>\$62,110.00</b>
				<b>Amount Paid</b>	<b>\$0.00</b>
				<b>Amount Due</b>	<b>\$0.00</b>
				<b>Log Number</b>	

<sup>a</sup>per Regulation 3-306.2 non-administrative permit condition changes shall be subject to the filing and initial fees required for new and modified equipment

<sup>b</sup>per Regulation 3, Schedule P, part 6

Because the proposed permit condition changes trigger a PSD analysis, a public notice is required per Regulation 2-2-405. Therefore, the permit condition change is considered to be non-administrative and is subject to Regulation 3-306.2.

**STATEMENT OF COMPLIANCE**

S-1, and S-3 Gas Turbines are expected to continue to comply all applicable District, State, and Federal regulations and District permit conditions. As discussed earlier, the proposed increases in gas turbine start-up emission rates complies with the air quality impact analysis requirements of the District PSD regulations.

This project is **categorically exempt** from District CEQA Regulation 2-1-311 pursuant to Regulation 2-1-312.11 (Permit applications for a new/modified source(s) or for process changes which will satisfy the "No Net Emission Increase" provisions of Regulation 2, Rule 2, and for which there is no possibility that the project may have any significant environmental effect in connection with any environmental media or resources other than air quality) and therefore is not subject to CEQA review.

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The LMEC facility is **not** located within 1000 feet of the outer boundary of a K-12 school and is therefore not subject to the public notification requirements of Regulation 2-1-412.

A Toxics Risk Screening Analysis is not required due to the proposed changes in permit conditions because there will be no resulting increase in toxic air contaminant emissions from the LMEC facility. TBACT does not apply to this project.

The proposed emission rate changes and permit condition changes do not trigger new reviews of the BACT, Offsets, PSD, NSPS, and NESHAPS regulations.

### PERMIT CONDITIONS

Permit condition #16676 will be modified as shown below:

#### Conditions for S-1 & S-3 Gas Turbines, S-2 & S-4 HRSG, and S-5 Auxiliary Boiler

##### Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen minute increments.
MM BTU:	million British thermal units
Gas Turbine Start-up Mode:	The lesser of the first <del>120</del> 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of <del>condition</del> parts 21(b) and 21(d).
<u>Steam Turbine Cold Start-up:</u>	<u>The lesser of the first 360 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of parts 21(b) and 21(d), following a steam turbine shutdown of at least 72 hours.</u>
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in <del>Condition</del> Parts 21(a) through 21(f) until termination of fuel flow to the Gas Turbine.

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Auxiliary Boiler Start-up:	The lesser of the first 120 minutes of continuous fuel flow to an Auxiliary Boiler after fuel flow is initiated; or the period of time from fuel flow initiation until the Boiler achieves two consecutive CEM data points in compliance with the emission concentration limits of <u>condition parts</u> 28(b) and 28(d).
Auxiliary Boiler Shutdown:	The lesser of the 30 minute period immediately prior the termination of fuel flow to the Auxiliary Boiler; or the period of time from non-compliance with any requirement listed in <u>ConditionParts</u> 28(a) through 28(d) until termination of fuel flow to the auxiliary boiler.
Specified PAHs:	<p>The polycyclic aromatic hydrocarbons listed below shall be considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds.</p> <p>Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene</p>
Corrected Concentration:	The concentration of any pollutant (generally NO <sub>x</sub> , CO, or NH <sub>3</sub> ) corrected to a standard stack gas oxygen concentration. For emission point P-1 (Gas Turbine S-1 and HRSG S-2) and emission point P-2 (Gas Turbine S-3 and HRSG S-4) the standard stack gas oxygen concentration is 15% O <sub>2</sub> by volume on a dry basis. For emission point P-3 (Auxiliary Boiler S-5), the standard stack gas oxygen concentration is 3% O <sub>2</sub> by volume on a dry basis.
Commissioning Activities:	All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the LMEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, auxiliary boiler, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange.
<u>Combustor Tuning Activities:</u>	<u>All testing, adjustment, tuning, and calibration activities recommended by the gas turbine manufacturer to insure safe and reliable steady-state operation of the gas turbines following replacement of the combustor. This includes, but is not limited to, adjusting the amount of fuel distributed between the combustion turbine's staged fuel systems to</u>



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Combustor Tuning Period: simultaneously minimize NO<sub>x</sub> and CO production while minimizing combustor dynamics and ensuring combustor stability.  
The cumulative period, not to exceed 360 minutes, during which combustor tuning activities are taking place

Precursor Organic

Compounds (POCs):

Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate

CEC CPM:

California Energy Commission Compliance Program Manager

Conditions for the Commissioning Period

1. The owner/operator of the Los Medanos Energy Center (LMEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines, S-2 & S-4 Heat Recovery Steam Generators (HRSG), and S-5 Auxiliary Boiler to the maximum extent possible during the commissioning period. ConditionParts 1 through 13 shall only apply during the commissioning period as defined above. Unless otherwise indicated, ConditionParts 14 through 51 shall apply after the commissioning period has ended.
2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the combustors of S-1 & S-3 Gas Turbines, S-2 & S-4 Heat Recovery Steam Generators, and S-5 Auxiliary Boiler shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.
3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, A-1 & A-3 SCR Systems and A-2 & A-4 Oxidation Catalysts shall be installed, adjusted, and operated to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators.
4. Coincident with the steady-state operation of A-1 & A-3 SCR Systems and A-2 & A-4 Oxidation Catalysts pursuant to conditionparts 3, 8, and 9, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall comply with the NO<sub>x</sub> and CO emission limitations specified in conditionparts 21(a) through 21(d).
5. The owner/operator of the LMEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1 and S-3 Gas Turbines describing the procedures to be followed during the commissioning of the turbines, HRSGs, auxiliary boiler, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO<sub>x</sub> combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NO<sub>x</sub> continuous emission monitors, and any activities requiring the firing of S-1 and S-3

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Gas Turbines and S-2 and S-4 HRSGs without abatement by the SCR Systems or oxidation catalysts.

6. During the commissioning period, the owner/operator of the LMEC shall demonstrate compliance with ~~condition~~parts 11 and 12 through the use of properly operated and maintained continuous emission monitors and recorders for the following parameters:

firing hours  
fuel flow rates  
stack gas nitrogen oxide emission concentrations,  
stack gas carbon monoxide emission concentrations  
stack gas oxygen concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for S-1 and S-3 Gas Turbines, S-2 and S-4 HRSGs, and S-5 Auxiliary Boiler. The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen oxide mass emission rates, carbon monoxide mass emission rates, and NO<sub>x</sub> and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

7. The District-approved continuous monitors specified in ~~condition~~part 6 shall be installed, calibrated, and operational prior to first firing of S-1 & S-3 Gas Turbines, S-2 & S-4 Heat Recovery Steam Generators, and S-5 Auxiliary Boiler. After first firing of the turbines and auxiliary boiler, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NO<sub>x</sub> emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.
8. The total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide and carbon monoxide emissions by A-1 SCR System and A-2 Oxidation Catalyst shall not exceed 250 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without SCR and oxidation catalysts in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 250 firing hours without abatement shall expire.
9. The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide and carbon monoxide emissions by A-3 SCR System and A-4 Oxidation Catalyst shall not exceed 250 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning

activities that can only be properly executed without SCR and oxidation catalysts in place. Upon

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completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 250 firing hours without abatement shall expire.

10. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM<sub>10</sub>, and sulfur dioxide that are emitted by S-1, S-2, S-3, S-4, and S-5 during the commissioning period shall accrue towards the consecutive twelve month emission limits specified in [conditionpart 33](#).
11. Combined pollutant emissions from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of S-1 & S-3 Gas Turbines.

NO <sub>x</sub> (as NO <sub>2</sub> )	3,511 pounds per calendar day	616 pounds/hour
CO	10,848 pounds per calendar day	5,053.8 pounds/hour
POC (as CH <sub>4</sub> )	720 pounds per calendar day	
PM <sub>10</sub>	816 pounds per calendar day	
SO <sub>2</sub>	268 pounds per calendar day	

12. Pollutant emissions from S-5 Auxiliary Boiler shall not exceed the following limits during the commissioning period. These emission limits shall include emissions that occur during S-5 Auxiliary Boiler start-ups.

NO <sub>x</sub> (as NO <sub>2</sub> )	268 pounds per calendar day	<del>2.94</del> <a href="#">21</a> pounds per hour
CO	233.8 pounds per calendar day	<del>9.74</del> <a href="#">14</a> pounds per hour
POC (as CH <sub>4</sub> )	16 pounds per calendar day	
PM <sub>10</sub>	60 pounds per calendar day	
SO <sub>2</sub>	8 pounds per calendar day	

13. Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with [conditionpart 23](#). The source test shall determine NO<sub>x</sub>, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty calendar days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC CPM a detailed source test plan designed to satisfy the requirements of this [conditionpart](#). The District and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC

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CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within 30 days of the source testing date.

**Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs) (S-2 & S-4).**

14. The Gas Turbines (S-1 and S-3) and HRSGs (S-2 and S-4) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-1, S-2, S-3, and S-4 shall sample and analyze the gas from each supply source at least once every 30 consecutive days to determine the sulfur content of the gas. (BACT for SO<sub>2</sub> and PM<sub>10</sub>)
15. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 2,225.1 MM BTU per hour, averaged over any rolling 3-hour period. (PSD for NO<sub>x</sub>)
16. The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 50,738.24 MM BTU per calendar day. (PSD for PM<sub>10</sub>)
17. The combined cumulative heat input rate for both Gas Turbines (S-1 and S-3) and both HRSGs (S-2 and S-4) shall not exceed 34,010,400 MM BTU per year. (Offsets)
18. The HRSG duct burners shall not be fired unless its associated Gas Turbine is in operation. (BACT for NO<sub>x</sub>, CO, POC)
19. The Gas Turbine (S-1) and HRSG (S-2) shall be abated by the properly operated and properly maintained Oxidizing Catalyst (A-2) and Selective Catalytic Reduction System (A-1), in series. (BACT for NO<sub>x</sub> and CO)
20. The Gas Turbine (S-3) and HRSG (S-4) shall be abated by the properly operated and properly maintained Oxidizing Catalyst (A-4) and Selective Catalytic Reduction System (A-3), in series. (BACT for NO<sub>x</sub> and CO)
21. The owner/operator of the Gas Turbines (S-1 and S-3) and HRSGs (S-2 and S-4) shall meet all of the requirements listed in (a) through (h) below, except during a Gas Turbine Start-up, ~~or~~ a Gas Turbine Shutdown, a steam turbine cold start-up, or a gas turbine combustor tuning period. (BACT, PSD, and Toxic Risk Management Policy)
  - (a) Nitrogen oxide emissions at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after control by the A-1 SCR System and A-2 Oxidation Catalyst) shall not exceed 20 pounds per hour, calculated as NO<sub>2</sub>, nor 0.009 lbs/MM BTU of natural gas fired. Nitrogen oxide

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emissions at P-2 (the combined exhaust point for the S-3 Gas Turbine and the S-4 HRSG after control by the A-3 SCR System and A-4 Oxidation Catalyst) shall not exceed 20 pounds per hour, calculated as NO<sub>2</sub>, nor 0.009 lbs/MM BTU of natural gas fired. (PSD for NO<sub>x</sub>)

- (b) The nitrogen oxide concentration at P-1 and P-2 each shall not exceed 2.5 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any 1-hour period. (BACT for NO<sub>x</sub>)
  - (c) Carbon monoxide emissions at P-1 and P-2 each shall not exceed 29.2 pounds per hour, nor 0.0132 lb/MM BTU of natural gas fired. (PSD for CO)
  - (d) The carbon monoxide concentration at P-1 and P-2 each shall not exceed 6 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for CO)
  - (e) Ammonia (NH<sub>3</sub>) emissions at P-1 and P-2 each shall not exceed 10 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous records of the ammonia injection rate to A-1 and A-3 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-3 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit [conditionpart](#) 38. (TRMP for NH<sub>3</sub>)
  - (f) Precursor organic compound (POC) emissions at P-1 and P-2 each shall not exceed 3.8 pounds per hour, nor 0.0017 lb/MM BTU of natural gas fired. (BACT for POC)
  - (g) Sulfur dioxide (SO<sub>2</sub>) mass emissions at P-1 and P-2 each shall not exceed 6.2 pounds per hour or 0.00277 lb/MM BTU of natural gas fired. (BACT for SO<sub>2</sub>)
  - (h) Particulate matter (PM<sub>10</sub>) mass emissions at P-1 and P-2 each shall not exceed 16.3 pounds per hour or 0.0073 lb/MM BTU of natural gas fired. (BACT for PM<sub>10</sub>)
22. The following [conditionparts](#) shall apply to NO<sub>x</sub> emissions resulting from or attributable to transient, non-steady state operating conditions. (BACT for NO<sub>x</sub>)
- (a) CEM NO<sub>x</sub> emission concentration data points that result from or are attributable to transient, non-steady state conditions shall not be subject to the emission limitations specified in [ConditionPart](#) 21(b). In any event, the nitrogen oxide concentration at P-1 and P-2 each shall not exceed 2.5 ppmv, corrected to 15% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. All CEM NO<sub>x</sub> emission concentration data points shall be utilized when determining compliance with this emission concentration limit.
  - (b) The emission limitation specified in [ConditionPart](#) 22(a) shall be valid for a period not to exceed 24 months from the end of the Commissioning period. At such time the emission limitation specified in [ConditionPart](#) 21(b) shall apply for all operating conditions except gas turbine start-up

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- (c) and shutdown periods, steam turbine cold start-ups and combustor tuning periods unless specific transient, non-steady state conditions are identified pursuant to conditionparts 22(f) and (g).

(d) Definitions

A transient, non-steady state condition shall occur when the following conditions exist:

- (1) One or more equipment design features is unable to support rapid changes in operation and respond to and adjust all operating parameters required to maintain the steady-state NO<sub>x</sub> emission limit specified in conditionpart 21(b). A change in operation shall be limited to one or more of the following: a change in combustion turbine load greater than 6 MW/minute; a change in SCR system space velocity greater than 50 ft/minute; initiation/shutdown of the evaporative cooler; initiation/shutdown of the duct burners; and a change in duct burner firing rate greater than 600,000 BTU/minute. Additional non-steady state conditions may be defined based upon operational experience and mutual written agreement of the owner/operator, the District, ARB, and EPA.
  - (2) For purposed of this conditionpart, transient, non-steady state conditions shall not include the start-up and shutdown periods that are the subject of conditionpart 23.
- (e) The owner/operator shall maintain continuous emission monitor (CEM) data and complete records of plant emission performance under transient, non-steady state conditions. The owner/operator shall record the NO<sub>x</sub> emission concentration and document the cause of each transient, non-steady state condition with operational data. A description of the specific parameters that will be monitored to document a transient, non-steady state condition shall be submitted to the District, ARB, and EPA for approval at least 60 days prior to the end of the Commissioning period.
- (e) Within 6 months of the end of the Commissioning period, the owner/operator shall compile and submit source test data, using a District-approved test protocol, to assess NO<sub>x</sub> emissions under transient, non-steady state conditions. A source test protocol shall be submitted to the District and EPA for approval at least 60 days prior to testing.
- (f) Within 15 months of the end of the Commissioning period, the owner/operator shall submit a plan to the District and EPA designed to minimize emissions during transient, non-steady state conditions. The plan shall identify reasonable measures that will be taken to control NO<sub>x</sub> emissions. This plan shall be based upon the CEM and source test data developed in accordance with conditionpart 22(e) and actual operating experience during the preceding months of plant operation. The plan shall be developed in consultation with the manufacturers selected for the gas turbine, HRSG, control systems, and air pollution control units. After the plan has been approved by the District and EPA, the owner/operator shall use the procedures described in the plan to minimize NO<sub>x</sub> emissions during transient, non-steady state conditions.



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(g) On a semi-annual basis, for the first 24 months after the end of the Commissioning period, the owner/operator shall provide a report to the District with continuous emission monitoring and source test data developed in accordance with this ~~condition~~ part. The District will use the data and related operating experience to establish maximum NO<sub>x</sub> emission limits for transient, non-steady state conditions for the following 6 month period. The District will consider operations at similar (e.g., electrical generation and fuel-type) facilities in determining the revised emission limits. In no event shall the NO<sub>x</sub> emission limits established pursuant to section (g) be less than the NO<sub>x</sub> emission limits specified in ConditionPart 21(b). In addition, if appropriate, on a semi-annual basis the district will use all data and related operating experience to establish (i) a revised definition of transient, non-steady state conditions to which the NO<sub>x</sub> emission limitations established pursuant to this section (g) shall apply, and (ii) the data collection and recordkeeping requirements that the owner/operator shall use to document the occurrence of transient non-steady state conditions. The Title V operating permit shall be amended as necessary to reflect the data collection and recordkeeping requirements established under 22(g)(ii).

23. The pollutant emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or shutdown or during a gas turbine combustor tuning period shall not exceed the limits established below. ~~These limits apply to any 60 minute period, not a three-hour average.~~ (PSD)

	Start-Up (lb/start-up)	Shutdown (lb/shutdown)	<u>Steam Turbine Cold Start-up or Combustor Tuning Period (lb/start-up or lb/period)</u>
(a) Oxides of Nitrogen (as NO <sub>2</sub> )	240	20	<u>600</u>
(b) Carbon Monoxide (CO)	2514	44.1	<u>2514</u>
(c) Precursor Organic Compounds (as CH <sub>4</sub> )	48	8	<u>96</u>

Within three months of the end of the Commissioning period, the owner/operator shall submit a plan designed to minimize emissions during the transient conditions encountered during gas turbine start-ups and shutdowns. This plan shall indicate what steps will be taken to start controlling NO<sub>x</sub> emissions as soon as feasible, including when ammonia can be fed to the SCR system without producing ammonia slip in excess of 10 ppmvd @ 15% O<sub>2</sub>. This plan shall be based upon the experience gathered from the source tests performed per ~~condition~~ part #13 and actual operating experience gained during the first six-months of operation. This plan shall also be developed in consultation with the manufacturers of the gas turbines, HRSGs, control systems, and air pollution control units. This plan shall be submitted to the CEC CPM for approval. After the plan has been approved, the owner/operator shall use the procedures included in the plan to minimize NO<sub>x</sub> emissions during gas turbine start-ups and shutdowns.

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Within 24 months of the end of the Commissioning period, the owner/operator shall submit a report to the District and the CEC CPM that establishes reasonable maximum hourly mass emission rates for start-up and shutdown conditions. The revised mass emission rates shall be based upon source test and continuous emission monitoring data. Pending approval of the District and the CEC CPM, these revised mass emission rates shall be established as new emission limitations that will supersede the limits included in this conditionpart.

24. No more than one of tThe Gas Turbines (S-1 and S-3) shall ~~not~~ be in start-up mode, supporting a steam turbine cold start-up, or undergoing combustor tuning at any point in time. simultaneously. The total number of hours during which the Gas Turbines (S-1 and S-3) may be operated to support a steam turbine cold start-up or may undergo combustor tuning shall not exceed 30 hours per year per gas turbine. (PSD)

**Conditions for the Auxiliary Boiler (S-5)**

25. The Auxiliary Boiler (S-5) shall be fired exclusively on natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-5 shall sample and test the gas from each supply source at least once every 30 consecutive days to determine the sulfur content of the gas. (BACT for SO<sub>2</sub> and PM<sub>10</sub>)
26. The heat input rate to the Auxiliary Boiler (S-5) shall not exceed 320 million BTU per hour, averaged over any rolling 3-hour period. (Cumulative Increase)
27. The cumulative heat input rate to the Auxiliary Boiler (S-5) shall not exceed 480,000 million BTU per year. (Cumulative Increase)
28. The owner/operator of the Auxiliary Boiler (S-5) shall meet all of the requirements listed in (a) through (d) below, except during an Auxiliary Boiler Start-up or an Auxiliary Boiler Shutdown. (BACT, PSD)
- (a) Nitrogen oxide emissions at P-3 (the exhaust point for the Auxiliary Boiler) shall not exceed 3.5 pounds per hour, calculated as NO<sub>2</sub>. (PSD for NO<sub>x</sub>)
  - (b) The nitrogen oxide concentration at P-3 shall not exceed 9.0 ppmv, measured as NO<sub>x</sub>, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for NO<sub>x</sub>)
  - (c) Carbon monoxide emissions at P-3 shall not exceed 11.8 pounds per hour. (PSD for CO)
  - (d) The carbon monoxide concentration at P-3 shall not exceed 50 ppmv, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. (BACT for CO)



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- (e) Precursor organic compound (POC) emissions at P-3 shall not exceed 1.7 pounds per hour. (BACT for POC)
  - (f) Sulfur dioxide (SO<sub>2</sub>) mass emissions at P-3 shall not exceed 0.5 pounds per hour. (BACT for SO<sub>2</sub>)
  - (g) Particulate matter (PM<sub>10</sub>) mass emissions at P-3 shall not exceed 1.6 pounds per hour. (BACT for PM<sub>10</sub>)
  - (h) Ammonia (NH<sub>3</sub>) emissions at P-3 shall not exceed 10 ppmv, corrected to 3% O<sub>2</sub>, on a dry basis, averaged over any rolling 3-hour period. This ammonia concentration shall be verified by the continuous recording of the ammonia injection rate at the A-5 SCR System. The correlation between the auxiliary boiler heat input rate, A-5 SCR System ammonia injection rate, and corresponding ammonia emission concentration at P-3 shall be determined in accordance with permit [conditionpart](#) 38. (TRMP)
29. The Auxiliary Boiler (S-5), its burners, combustion chamber, and exhaust system shall be designed and constructed so that the boiler can be retrofitted with an oxidizing catalyst in the event the Auxiliary Boiler cannot consistently comply with the emission limitations specified in [conditionpart](#) 28. S-5 Auxiliary Boiler shall be abated by the properly operating and maintained A-5 Selective Catalytic Reduction System. (BACT for NO<sub>x</sub>, CO)

**Conditions for All Sources  
(S-1, S-2, S-3, S-4, and S-5)**

30. The combined heat input rate to the Gas Turbines (S-1 and S-3), HRSGs (S-2 and S-4), and Auxiliary Boiler (S-5) shall not exceed 109,157 million BTU per calendar day. (PSD, CEC Offsets)
31. The cumulative heat input rate to the Gas Turbines (S-1 and S-3), HRSGs (S-2 and S-4), and Auxiliary Boiler (S-5) combined shall not exceed 34,490,400 million BTU per year. (Offsets)
32. Total combined emissions from the Gas Turbines, HRSGs, and Auxiliary Boiler (S-1, S-2, S-3, S-4, and S-5), including emissions generated during Gas Turbine Start-ups, Gas Turbine Shutdowns, [Steam Turbine Cold Start-ups, Gas Turbine Combustor Tuning Activities](#), Auxiliary Boiler Start-ups, and Auxiliary Boiler Shutdowns, shall not exceed the following limits during any calendar day:
- (a) 1342 pounds of NO<sub>x</sub> (as NO<sub>2</sub>) per day (CEQA)
  - (b) 6445 pounds of CO per day (PSD)
  - (c) 271.3 pounds of POC (as CH<sub>4</sub>) per day (CEQA)
  - (d) 742 pounds of PM<sub>10</sub> per day (PSD)
  - (e) 282.6 pounds of SO<sub>2</sub> per day (BACT)

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33. Cumulative emissions from the Gas Turbines, HRSGs, and the Auxiliary Boiler combined (S-1, S-2, S-3, S-4, and S-5), including emissions generated during Gas Turbine Start-ups, Gas Turbine Shutdowns, Steam Turbine Cold Start-ups, Gas Turbine Combustor Tuning Activities, Auxiliary Boiler Start-ups, and Auxiliary Boiler Shutdowns, shall not exceed the following limits during any consecutive twelve-month period:

- (a) 175.7 tons of NO<sub>x</sub> (as NO<sub>2</sub>) per year (Offsets, PSD)
- (b) 506.4 tons of CO per year (Cumulative Increase)
- (c) 33.9 tons of POC (as CH<sub>4</sub>) per year (Offsets)
- (d) 131.6 tons of PM<sub>10</sub> per year (Offsets, PSD)
- (e) 47.11 tons of SO<sub>2</sub> per year (Cumulative Increase)

34. The maximum projected annual toxic air contaminant emissions from the Gas Turbines, HRSGs, and the Auxiliary Boiler combined (S-1, S-2, S-3, S-4, and S-5) shall not exceed the following limits:

- (a) 3,817 pounds of formaldehyde per year
- (b) 460.9 pounds of benzene per year
- (c) 78.5 pounds of Specified polycyclic aromatic hydrocarbons (PAHs) per year

unless the owner/operator meets the requirements of (d), (e), and (f) below:

- (d) The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District (District) approved procedures and unit risk factors in effect at the time of the analysis. The calculated excess cancer risk shall not exceed 1.0 in one million.
- (e) The owner/operator shall perform a second risk analysis using the emission rates determined by source test and the procedures and unit risk factors in effect when the Determination of Compliance was issued. The calculated excess cancer risk shall not exceed 1.0 in one million.
- (f) Both of these risk analyses shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will satisfy the conditions stated in parts (d) and (e) above, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. The Title V operating permit shall be amended to reflect these adjustments. (TRMP)

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35. The owner/operator shall demonstrate compliance with ~~condition~~parts 15 through 18, 21(a) through 21(d), 23, 24, 26, 28(a) through 28(d), 32(a), 32(b), 33(a), and 33(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods and Gas Turbine Combustor Tuning Periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 and S-2 combined, S-3 and S-4 combined, and S-5.
- (b) Oxygen (O<sub>2</sub>) Concentrations, Nitrogen Oxides (NO<sub>x</sub>) Concentrations, and Carbon Monoxide (CO) Concentrations at each of the following exhaust points: P-1, P-2 and P-3.
- (c) Ammonia injection rate at A-1 and A-3 SCR Systems

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total Firing Hours, the average hourly Fuel Flow Rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (~~ed~~) Heat Input Rate for each of the following sources: S-1 and S-2 combined, S-3 and S-4 combined, and S-5.
- (~~de~~) Corrected NO<sub>x</sub> concentrations, NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1, P-2, and P-3.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in ~~condition~~parts 35(~~ed~~) and 35(~~de~~) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

- (~~ef~~) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
- (~~fg~~) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined, the Auxiliary Boiler, and all five sources (S-1, S-2, S-3, S-4, and S-5) combined.
- (~~gh~~) the average NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), CO mass emissions, and corrected NO<sub>x</sub> and CO emission concentrations for every clock hour and for every rolling 3-hour period.
- (~~hi~~) on an hourly basis, the cumulative total NO<sub>x</sub> mass emissions (as NO<sub>2</sub>) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, the Auxiliary Boiler, and all five sources (S-1, S-2, S-3, S-4, and S-5) combined.

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- (~~ij~~) For each calendar day, the average hourly Heat Input Rates, Corrected NO<sub>x</sub> emission concentrations, NO<sub>x</sub> mass emissions (as NO<sub>2</sub>), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined and the Auxiliary Boiler.
- (~~jk~~) on a daily basis, the cumulative total NO<sub>x</sub> mass emissions (as NO<sub>2</sub>) and cumulative total CO mass emissions, for each calendar year for all five sources (S-1, S-2, S-3, S-4, and S-5) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

36. To demonstrate compliance with ~~conditions parts~~ 23(c), 32(c) through 32(e), and 33(c) through 33(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM<sub>10</sub>) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO<sub>2</sub>) mass emissions from each power train and the auxiliary boiler. The owner/operator shall use the actual Heat Input Rates calculated pursuant to ~~condition part~~ 35, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, actual steam turbine cold start-up times, actual gas turbine combustor tuning times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:
- (a) For each calendar day, POC, PM<sub>10</sub>, and SO<sub>2</sub> Emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined); the Auxiliary Boiler; and the five sources (S-1, S-2, S-3, S-4, and S-5) combined.
- (b) on a daily basis, the cumulative total POC, PM<sub>10</sub>, and SO<sub>2</sub> mass emissions, for each year for all five sources (S-1, S-2, S-3, S-4, and S-5) combined.

(Offsets, PSD, Cumulative Increase)

37. To demonstrate compliance with ~~ConditionPart~~ 34, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 39,390,400 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of Heat Input) determined by any source test at the Gas Turbine, HRSG, or Auxiliary Boiler. (TRMP)
38. Within 60 days of start-up of the LMEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 and P-3 to determine the corrected ammonia (NH<sub>3</sub>) emission concentration to determine compliance with ~~condition part~~ 21(e) and 28(h). The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-3 SCR System ammonia injection rate, and the corresponding NH<sub>3</sub> emission concentration at emission point P-1 or P-2 and the correlation between the heat input rate of the auxiliary boiler, A-5 SCR System ammonia injection rate, and the corresponding NH<sub>3</sub> emission concentration at emission point P-3. The source test shall be conducted over the expected operating range of the turbine (at a

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minimum, 60%, 80%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NO<sub>x</sub> emission reductions while maintaining ammonia slip levels. Continuing compliance with [ConditionPart 21\(e\)](#) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)

39. Within 60 days of start-up of the LMEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load to determine compliance with [ConditionParts 21\(a\), \(b\), \(c\), \(d\), \(f\), \(g\), & \(h\)](#) and while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with [ConditionParts 21\(c\), \(d\), & \(f\)](#) and to verify the accuracy of the continuous emission monitors required in [conditionpart 35](#). The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and emissions, methane, ethane, and particulate matter (PM<sub>10</sub>) emissions including condensable particulate matter. (BACT, offsets)
40. Within 60 days of start-up of the LMEC and on an annual basis thereafter, the owner/operator shall conduct a District approved source test on exhaust point P-3 while the Auxiliary Boiler (S-5) is operating at maximum allowable operating rates to determine compliance with the emission limitations of [ConditionPart 28\(a\) through 28\(g\)](#) and to verify the accuracy of the continuous emission monitors required in [conditionpart 35](#). The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and emissions, and particulate matter (PM<sub>10</sub>) emissions including condensable particulate matter. (BACT, offsets)
41. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM<sub>10</sub> emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 30 days of conducting the tests. (BACT)
42. Within 60 days of start-up of the LMEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with [Condition part 34](#). Unless the requirements of [conditionpart 42\(b\)](#) have been met, the owner/operator shall determine the formaldehyde, benzene, and Specified PAH emission rates (in pounds/MM BTU). If any of the

above pollutants are not detected (below the analytical detection limit), the emission concentration for that pollutant shall be deemed to be one half (50%) of the detection limit concentration.

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(TRMP)

- (a) The owner/operator shall calculate the maximum projected annual emission rate for each pollutant by multiplying the pollutant emission rate (in pounds/MM BTU; determined by source testing) by 34,490,400 MM BTU/year.
- (b) If three consecutive biennial source tests demonstrate that the emission rates calculated pursuant to part (a) for any of the compounds listed below are less than the annual emission rates shown, then the owner/operator may reduce the frequency of future testing for that pollutant to once every five years.

Benzene	≤	221 pounds/year
Formaldehyde	≤	1,834 pounds/year
Specified PAH's	≤	38 pounds/year

(TRMP)

- 43. The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)
- 44. The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emissions, monitor excesses, breakdowns, etc.), source test and analytical records, emission calculation records, records of steam turbine cold start-ups and gas turbine combustor tuning, and records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)
- 45. The owner/operator shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)
- 46. The stack heights of the emission points P-1 and P-2 shall be at least 150 feet above mean sea level (approximately 138.8 feet above grade level at the stack base). The stack height of the emission point P-3 shall be at least 100.6 feet above mean sea level (approximately 88.6 feet above grade level at the stack base). (PSD, TRMP)



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47. The Owner/Operator of LMEC shall maintain adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall comply with the Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval. (Regulation 1-501)
48. Within 180 days of the issuance of the Authority to Construct, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required by Condition Parts 38, 39, 40, and 42. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)
49. Prior to the issuance of the BAAQMD Authority to Construct for the Los Medanos Energy Center, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of 25.88 tons/year of Nitrogen Oxides and 8.05 tons/year of PM<sub>10</sub> or equivalent as defined by District Regulations 2-2-302.1, 2-2-302.2, and 2-2-303.1 are under their control through option to purchase contracts or equivalent binding legal documents. (Offsets)
50. Prior to the start of construction of the Los Medanos Energy Center, the Owner/Operator shall provide emission reduction credits in the amount of 25.88 tons/year of Nitrogen Oxides and 8.05 tons/year of PM<sub>10</sub> or equivalent as defined by District Regulations 2-2-302.1, 2-2-302.2, and 2-2-303.1. (Offsets)
51. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of LMEC shall submit an application to the District for a Federal (Title V) Operating Permit within 12 months of the date of issuance of the BAAQMD Permit to Operate for the LMEC. (Regulation 2-6-404.1)
52. The heat input to the fire pump diesel engine resulting from maintenance and testing activities shall not exceed 211 MM BTU totaled over any consecutive twelve month period. (TRMP)
53. Deleted August, 2001.
54. The Owner/Operator shall submit a Preplanned Abatement Strategy as described in BAAQMD Regulation 4, Air Pollution Episode Plan, within 120 days after issuance of the Title V permit. After the plan has been approved by the APCO, the owner/operator shall keep records of implementation on an event basis. (Basis: BAAQMD Regulation 4)
55. To demonstrate compliance with part 24, the owner/operator shall record the start time, end time, and duration of each steam turbine cold start-up and each gas turbine combustor tuning period. On an annual basis, the owner/operator shall submit a report to the District and the CEC CPM describing the total number of hours during which each turbine was operated in support of a steam turbine cold start-up or combustor tuning mode during the year. (PSD)

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT***PERMIT SERVICES DIVISION***Permit Evaluation and Emission Calculations**

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**RECOMMENDATION**

Issue a **Change of Conditions Letter** for the following sources:

- S-1 Combustion Gas Turbine #1, General Electric Frame 7FA Model PG 7241; 1,925.1 MM BTU per hour (HHV), equipped with dry low-NO<sub>x</sub> Combustors, abated by A-1 Selective Catalytic Reduction System and A-2 Oxidation Catalyst**
- S-3 Combustion Gas Turbine #2, General Electric Frame 7FA Model PG 7241; 1,925.1 MM BTU per hour (HHV), equipped with dry low-NO<sub>x</sub> Combustors, abated by A-3 Selective Catalytic Reduction System and A-4 Oxidation Catalyst**

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**Air Quality Engineer II**

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**Date**



**APPENDIX A**

**PSD AIR QUALITY IMPACT ANALYSIS**

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